GARDEN AND FOREST.

PUBLISHED WEEKLY BY

THE GARDEN AND FOREST PUBLISHING CO.

OFFICE: TRIBUNE BUILDING, NEW YORK.

Conducted by . . . . . Professor C. S. SARGENT.

ENTERED AS SECOND-CLASS MATTER AT THE POST-OFFICE AT NEW YORK, N. Y.

NEW YORK, WEDNESDAY, NOVEMBER 18, 1896.

TABLE OF CONTENTS.

PAGE.

EDITORIAL ARTICLES:—Variety Tests in the Experiment Stations 461
Artistic Supervision for Public Works 461
Lawn-infesting Insects 462
Conifers on the Grounds of the Kansas Agricultural College.—II. *F. C. Sears.* 462
Notes on a Trip to the Dismal Swamp . . . . . *Charles Louis Pollard.* 462
ENTOMOLOGICAL:—Lawn and Grass Infesting Insects.—I. (With figures.) *Professor J. B. Smith.* 463
NEW OR LITTLE-KNOWN PLANTS:—Aster infirmus. (With figure.) . . . . . *C. E. F.* 464
CULTURAL DEPARTMENT:—Bud Variation of the Concord Grape . . . . *W. Paddock.* 464
Carnation Notes . . . . . *W. N. Craig.* 466
Garden Notes . . . . . *W. E. Endicott.* 466
Indoor Work . . . . . *W. H. Taplin.* 467
Autumn Snowdrops . . . . . *J. N. Gerard.* 467
CORRESPONDENCE:—Apple-twig Blight . . . . . *F. C. Sears.* 467
EXHIBITIONS:—Chrysanthemums in Philadelphia 468
Chrysanthemums in Boston 468
RECENT PUBLICATIONS 469
NOTES 470
ILLUSTRATIONS:—Lawn and Grass Infesting Insects 463, 464
Aster infirmus, Fig. 65 465

Variety Tests in the Experiment Stations.

WE have more than once expressed the opinion that the work of our experiment stations in testing different varieties of fruits or vegetables is largely wasted. We do not mean by this that such tests have no value, but we feel that the trained investigators who have been organized in every state can use their time and talents to better advantage in establishing broad principles as the basis of farm and garden practice than they can in busying themselves with questions of such simple and elementary character that the farmers and gardeners can work them out without the aid of experts. One reason for the existence of experiment stations is that there are many problems which can only be successfully attacked by men of wide scientific knowledge who have been trained to accurate habits of research and generalization. Such investigations are costly, for the experiments often require expensive material and instruments which only educated men can use to advantage, and many of them need to be conducted through a long series of years before trustworthy results can be reached. This work is not only outside of the capacity of the individual farmer, but of farmers' clubs and horticultural societies. There is more than enough of this kind of research to absorb all the energy of the station workers, and it is a loss to the farming community when the limited number of skilled experimenters are taken away from these studies which they alone are able to prosecute successfully, and which are of such paramount importance. Any one can plant a dozen different varieties of Peas and keep a record of the dates on which they ripen, so as to find which is the earliest; any one can weigh the product of a dozen varieties of Strawberries and see which one is the most productive and which one has the longest bearing season. Perhaps in new states where there are unknown climatic conditions, with no experience in raising crops either in farm or garden to fall back upon, it is worth while for the stations to begin in this primary way. But when the bright young experimenters in our various stations grow old in the service and look back on the work of their lives they will hardly be satisfied if this has been confined or largely devoted to testing tomatoes.

Of course, we are assuming that these tests of varieties are trustworthy. But, in fact, with many fruits and vegetables the results in one place are not true for another. But even when these are carried out in a systematic manner, with uniformity of conditions, so far as soil, seed, etc., are concerned, the experimenter confronts the fact that the weather is quite outside of his control. Now, it often happens that a particular season not only affects the general yield of the apple crop, for example, but it affects different sorts in a different way, and, therefore, a test which does not cover a long series of years under similar conditions is of little use. In a recent number of the *Experiment Station Record* this fact is brought out in a very clear way. It is there stated that the test of varieties of Wheat or Corn, which covers only one or two seasons, does not prove with any certainty the relative adaptability of the varieties tested, even to a particular locality. This adaptability must be based on the average climate of the place, and such an average can only be secured by taking a number of consecutive seasons into account. The Illinois station not long ago published certain data regarding the tests with varieties of Corn during eight years, which make this point clear. Nine varieties were tried continuously, and a table in which the varieties are ranked according to the yield of shelled corn shows that the two varieties which stood lowest on the list the first year occupied the third and fourth place respectively when an average of the whole period was taken. The variety Leaming stands No. 1 on the list for the eight years taken together, and yet one year it stood near the bottom. One year Riley's Favorite and Golden Beauty ranked respectively first and second, but in the total average they stand last. Now, if we look over the records of the different stations where varieties of grains, fruits and vegetables have been largely tested, we will observe that these are not planted and tried every year, but disappear and reappear in the trials for different years without any apparent reason. This means that, even for the particular plot of ground in which it is tried in this fashion, we have no way of forming an accurate idea of the qualities of a given variety for an average season, while the results give no information whatever as to the adaptability of the variety to another section in any season.

These Illinois Wheat tests show one thing, and that is that the comparative behavior of different varieties for one season is no criterion for their probable relative behavior in the same place another year. This is a fact worth knowing, but it has been so thoroughly demonstrated that there is little need of proving it over again, and on the whole it is our opinion that the results of these tests are not worth what they cost. The experiment stations have established a great many truths in regard to dairy practice, to the feeding of animals for various purposes, to the methods of checking insect ravages and plant diseases, and in these and other ways they have already paid for themselves over and over again, but we do not recall any single benefit to cultivators that has come from even the most carefully conducted experiment with varieties of fruits or vegetables. We should be very grateful if some station director would point out definite instances in which work in this direction has proved of any great value. When we consider the time and money that have been spent in this way the present and prospective results ought to have some importance. Certainly, if the views in *The Record* are correct the methods ought to be changed, and it is a question worth discussing whether the practice should not be abandoned altogether.

THE value of commission experts in our cities, to whose decision artistic and æsthetic matters can be referred, has lately been demonstrated in Boston by the refusal of the Art Commission of that city to allow an inappropriate statue to be placed in the court-yard of the Public Library. It seems possible that the functions of such commissions can be usefully extended over a wider and more important

field. If it is desirable to keep bad statues and other so-called works of art out of our cities and to prevent the erection of good ones in inappropriate places, it is certainly more important to prevent the erection of ugly and inconvenient public buildings such as school-houses, court-houses and public libraries, and ugly and badly constructed bridges and other structures paid for by the public. The town of Brookline, in Massachusetts, at least believes that it is feasible to improve the appearance and character of her public buildings by the use of artistic advisers, and by a by-law recently adopted by the town and approved by the court, it becomes the duty of the selectmen to appoint a committee to whom the plans of all public buildings and other structures paid for by the citizens are to be submitted for approval or rejection. This plan seems to be a real step forward in artistic progress, and the results of the experiment made by this small community will be watched with interest everywhere.

Since the dry weather in early spring there has been abundant moisture in this vicinity all summer through, and the grass in lawns and pastures never grew more sturdily; nevertheless, we have rarely seen so many bare spaces in the turf of our city parks or suburban lawns as there have been during the present autumn. There may be many causes for this. It is certain that the Crab-grass has been unusually aggressive, and so have certain annual grasses and weeds, and after they have died down and turned black the natural conclusion is that they have killed the lawn grasses and left the ground bare. But it is clear that the trouble in many cases is deeper than this. There are places where the brown sod can be rolled up like a carpet and the dead grass can be pulled out by the handful, like the hair from an animal when it is shedding its coat. This indicates that some enemy has destroyed the roots of the grass, a devastation largely accomplished by cut-worms of several kinds and the larvæ of different insects. After these insects destroy the good grass, some annual grass, like Panicum sanguinale, takes hold, but the damage is done before the foul grass intrudes. One who watches these bare patches may now and then see a flicker boring into the ground, and in some cases these birds have been driven away as the supposed destroyers of the grass. Their presence, however, proves that the real enemies are certain grubs upon which they feed. The difficulty is not an easy one to remedy, and it is so serious that we have asked Professor Smith, Entomologist of the New Jersey Experiment Station, to give some account of the enemies which prey upon lawns and pastures, and the first part of his paper appears on another page of this issue. The article was not prepared for specialists, but it is written in such a way that every reader will be able to identify these pests and know how to apply the remedies so far as any effective ones have been devised.

Conifers on the Grounds of the Kansas Agricultural College.—II.

The White Pine, Pinus Strobus, has not, on the whole, proved a success. While it is unquestionably the most beautiful of the Pines that have been tried here, and while it will often grow well for a number of years, it does not seem able to endure the vicissitudes of the Kansas climate, and eventually dies. The oldest specimens on the College grounds at present are eleven trees on the south side of the lower farm. The soil is here a clay loam of about twelve inches in depth, underlaid by a reddish clay subsoil. These trees were sent here in 1886, being then about four years old. At present they seem to be in a vigorous condition, and during the season of 1896 have made a growth from the terminal shoot of from 16 to 30 inches. They give the following average measurement: Height, 16½ feet; diameter at the ground, 6 inches; at 2 feet, 4½ inches, and at 6 feet, 3 inches. The largest tree in the group measures 22½ feet high, with a diameter at the ground of 8 inches, and at 2 feet of 6½ inches. In the yard of a private house just east of the College grounds stands the oldest White Pine in this vicinity. Professor Mason says of it in a paper read in 1888: "A White Pine in Professor Gale's grounds, planted in 1875, and now apparently seventeen or eighteen years old, is 26 feet high, 9 inches in diameter at the ground, and 6 inches at 6 feet. It is perfectly straight, and the handsomest tree of all that I have measured." At present this tree gives the following measurements: "Height, 32½ feet; diameter at the ground, 13⅓ inches; at 2 feet, 11 inches, and at 6 feet, 9 inches, an increase in seven years of 6½ feet in height, and 4⅓ inches in diameter at the ground. But the top is dead, and the whole tree shows evidence of decline. The death of some of the White Pines on the College grounds might be attributed to unfavorable location, but this one is as favorably situated as it could possibly be.

The Table Mountain Pine, Pinus pungens, is perfectly hardy here, and for ornamental planting on a large tract, where a striking, picturesque effect is desired, it is not to be surpassed, but it would seem to be too crooked to be valuable as timber trees, and its growth is slow as compared with the Scotch and Austrian Pines.

The Dwarf Pine, Pinus pumilis, has been planted in considerable numbers for ornamental purposes, and is certainly admirable for that use where a low-growing evergreen is desired. It is perfectly hardy and grows very slowly. Two specimens in front of Horticultural Hall are now, as nearly as can be ascertained, nineteen years old, and measure 8 feet in height, with a spread of 12 feet. It is a tree which not only grows on very poor soil, but is very easily transplanted. The Pitch Pine, P. rigida, is also perfectly hardy and forms a good straight trunk, but it grows too slowly to be profitable here.

Agricultural College, Manhattan, Kan. *R. C. Sears.*

Notes on a Trip to the Dismal Swamp.

The large tract of inundated lowland in south-eastern Virginia known as the Dismal Swamp possesses an interest to workers in all branches of science from the fact that it is the first or most northern great series of coastal swamps extending from Norfolk southward for many miles. To the botanist such an area furnishes valuable opportunities for the study of geographical distribution and of habitat, and mainly with this object in view I made the expedition to the swamp last May in company with a geologist and two ornithologists. The accompanying notes on the flora of the region are the outcome of only two days' sojourn in the swamp itself.

In many parts of the area under consideration the term "dismal" is a misnomer, as the trees are not of sufficient size and density to exclude the sunlight altogether, or even to give that appearance of gloom afforded by the coniferous forests of the north. In the interior, however, especially around Lake Drummond, certain trees, such as Acer rubrum, Nyssa biflora, etc., attain a very great height. The majority of the remaining trees, like Magnolia glauca and Quercus nigra, do not exceed, for the most part, twenty or thirty feet. The last two species, in company with several ericaceous shrubs and the Hollies, Ilex glabra and I. opaca, when intertwined with the numerous woody vines that abound in the swamp, constitute an impenetrable jungle which defies even superficial investigation unless exploring botanists are armed with bush knives. While paddling up the Jericho Canal from Suffolk in a dug-out we noted several well-marked areas in which some one of these dominant species seemed to flourish at the expense of the others. Along the side of the canal for the first few miles, soil thrown out in the construction of the ditch forms a moderately firm bank, along which is a good towpath. Here the Cane grows rather sparsely, but there are numerous trees apparently not found in the interior, notably Aralia spinosa, Sassafras

Sassafras, Rhus copallina and several Oaks. A few introduced weeds, including the ubiquitous English Daisy, are scattered along the bank.

A few miles farther we notice a gradual subsidence of the embankment, the soil becomes more moist and the Cane grows in dense brakes, overarching the canal and effectively smothering the smaller herbaceous vegetation. Soon the water of the surrounding swamp is seen to merge with that of the ditch, and the Cane, finding no anchorage for its tough, ligneous root-stocks, disappears almost completely, its place being taken by masses of Woodwardia, which grow in from one to two feet of water, and whose fronds attain enormous dimensions. Around the roots of shrubs a quantity of Sphagnum lodges, mingled with decaying sticks and herbage, thus affording conditions favorable to the growth of such plants as Pogonia ophioglossoides, Limodorum tuberosum, Mitchella repens, Impatiens, and even Gaultheria procumbens, the flavor of the winterberries borne by the latter being fully equal to that of specimens from a mountain woodland farther north.

As one nears the end of the canal, shrubs and trees become thicker, and the Cane is again abundant. Smilax laurifolia and S. rotundifolia festoon the lower branches of the trees, while the Supplejack, Berchemia, the Fox Grape and the Cross Vine, Bignonia capreolata, strive for the possession of the lofty trunks. Fallen logs float on the surface of the water and become converted into veritable moss gardens, among which Polypodium polypodioides thrives.

The Bald Cypress, Taxodium distichum, is apparently less abundant in the swamp than formerly, and of the specimens observed by our party the majority were young. Lake Drummond is full of Cypress-stumps, indicating that a large number of these trees once grew within its area. The peculiarity exhibited by this species of forming enlarged butts, or elbows, often in connected series, is observable to less extent in most of the arborescent vegetation. The knees attain greater proportions in the Cypress, however, and seem to be designed to obviate rapid decay and to anchor the plant firmly in the depth of water that it prefers.

Lake Drummond, a sheet several miles in diameter, is the centering point of the various canals and ditches penetrating the swamp. Apparently its waters nowhere exceed ten feet in depth, except during the period of overflow in the spring. Around its margins lie, perhaps, the most densely wooded portions of the swamp, and innumerable stumps and tree-trunks, still standing erect in the water, tell the tale of a forest that once covered much of the present surface of the lake.

Several interesting additions to the flora of the Dismal Swamp have been detected of late. Dr. Britton and Mr. Hollick found Andromeda nitida during an autumn trip to the swamp several years ago. Within the last two seasons Dr. A. K. Fisher has collected Ilex lucida, and I have found Clematis crispa in considerable quantity. It is very certain that a well-equipped botanical expedition would find much of interest in the still unexplored parts of this peculiar region.

Washington, D. C. *Charles Louis Pollard.*

Entomological.

Lawn and Grass Infesting Insects.—I.

LAND cultivated in one kind of crop for many years successively tends to attract all the different kinds of insects that feed upon it. In some localities where Onions were grown in times past with excellent results, the Onion maggots now make it impossible to raise a crop. In many parts of New York state Wheat culture was for a time abandoned, because of the ravages of the Hessian fly. In parts of the central west it has become impossible to grow Corn more than two years in succession on the same ground, because of the abundance of insects that get into it after that time. Farmers have long known that after land has been in pasture for a few years, or has been mowed, the grass "runs out." They accept this fact and act upon it without much questioning as to just what this running out consists of; but in many cases the land has become so thoroughly infested with grass-feeding insects that the roots are no longer able to support a growth. Insects are not confined to farms or farm-lands; they occur wherever plants are grown in cities and villages, and are troublesome in the back yard, in the kitchen-garden, to the shade-trees, and even to the little patch of lawn in front of the house. The more extensive the lawn and, in a general way, the better kept it is, the more attractive it becomes to insects.

Insects of almost all orders are found in grass lands, and as there are few grass plots in which there is not also some clover, insects infesting this plant are also more or less abundant. It would be of little avail to list the dozens of species that we may find in such places; but it will be useful to know something of the few that are most abundantly met with, and that do most injury.

In the order Lepidoptera we find among the moths a series of little species known as Crambids (see figure 60), many

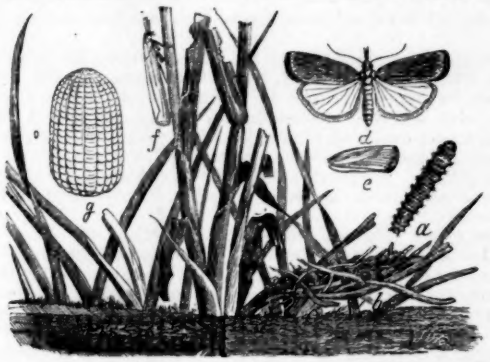

Fig. 60. Crambus vulvivagellus: *a*, the larva or root web-worm; *b*, a silken tube above ground; *c*, same beneath the surface; *d*, moth with wings expanded; *e*, wing of a variety; *f*, moth at rest; *g*, egg, very much enlarged.—From Div. Ent., U. S. Dept. Agl.

of which live in the larval stage on grass, either at the surface or just below it, feeding upon the roots or cutting off the stalks just at the level of the ground. Many of these caterpillars spin silken tubes above or below ground in which they rest, and from which they travel in search of food—never to any very great distance, since they always make their home where roots are most abundant or the grass plants most dense. The caterpillars, like all insects living more or less concealed, are yellowish or whitish in color, sometimes with a grayish tinge, always more or less set with bristly hair; with a brown or blackish head, and with the first segment behind the head armed with a brown shield. They live and feed during most of the summer and make their appearance in the moth state from midsummer on, producing a second brood of caterpillars which emerge as moths in spring. These moths are slender-bodied creatures, rarely more than half an inch in length, with narrow fore wings, yellowish or brown in color, sometimes mottled or streaked with golden and silver bands or lines. The hind wings are always broader, but are folded up so closely that they can be covered by the primaries, which in turn are so closely applied to the body that the insect, when at rest, looks like a little rolled-up cylinder, easily overlooked when resting on a blade of grass or on the paling of a fence. The head is quite prominent and is furnished with a pair of long palpi which resemble somewhat a snout, giving the creature, when at rest, rather a saucy appearance. These moths lay their eggs either upon the blades or stalks of grasses, or drop them loosely upon the ground; the young larva in any case making its way to the best feeding-place as soon as it is hatched. The egg itself, while very minute, is also very pretty, longitudinally ribbed, and the spaces between the ribs divided by impressed lines, so that it may be rather fancifully compared to a chubby ear of Indian corn. The caterpillars themselves are known as root web-worms, and where they are abundant in grass land they cause the death of patches here and there. It is evidence of their presence when little tufts of grass die in places without obvious cause, the spots increasing in size for a time, then remaining and perhaps recovering to some extent after midsummer; while late in the season other places show a similar appearance. If a tuft of grass or a small sod, from a spot just turning brown, be removed, and the earth shaken carefully from the roots, these caterpillars will be found in their silken tubes, while cut or

girdled roots or stalks show how the injury has been accomplished. In some cases we may find the caterpillar inside the stalk of grass, or even boring in a rather large root or crown.

In the order Coleoptera we have several species that are troublesome on lawns and in grass land. First among them, perhaps, may be considered the wire-worms. The term "wire-worm" is popularly used to designate two very different kinds of creatures, both of which may be found in grass land, but which have entirely different habits and life histories. One form of wire-worm is brown or blackish, from an inch to two inches in length, almost cylindrical, with many segments, two pairs of legs on each segment, and a habit of curling up when disturbed. This is one of the myriapods (see fig. 61), and

Fig. 61. A "wire-worm" belonging to the Myriapoda, Julus cœruleocinctus.

these insects are very apt to be present where the land is very rich, where there is much vegetable matter in the soil, and where barnyard manure is frequently and heavily applied. They are always associated with decay, and while they do some injury on living plants, yet their usual food is dead and decaying vegetable matter, including the dying roots of the grass plants. Frequently they bite into soft, juicy tissue, and sometimes induce a decay of which they afterward take advantage.

The other kind of wire-worm is yellow in color, also a slender but somewhat flattened creature, with only six legs at the anterior part of the body, and not often exceeding an inch in length. It does not coil up when disturbed. This is the larva of one of the click-beetles, or Elateridæ (see fig. 62), and is exceedingly destructive. It feeds on living-plant tissue and almost entirely upon the roots of plants. The life-period is a variable one, but is rarely less than two, and more frequently three, years, giving the individual insect a greater power for mischief than is usual, while it can readily be seen that from year to year the number of specimens must increase, as insects of different stages are found at the roots constantly. A lawn badly infested by these insects will show a poor appearance over the entire surface. There will hardly be distinct brown patches as with the preceding insects, but there will be a general poverty-stricken appearance over the entire surface, and the grass will get thin and feeble, the result of the feeding of numerous larvæ among the roots. When these creatures become full-grown, which is usually at or after midsummer of the last year of their larval life, they form a little cell in the ground just beneath the root mass, and there change to a pupa and soon after to a beetle, which, however, does not become fully matured until the spring following. The beetles make their appearance in May or June, sometimes even in April if the season is an early one, and there are a number of different species involved.

Fig. 62. A wire-worm. Larva of an Elaterid, or click-beetle.—After Riley.

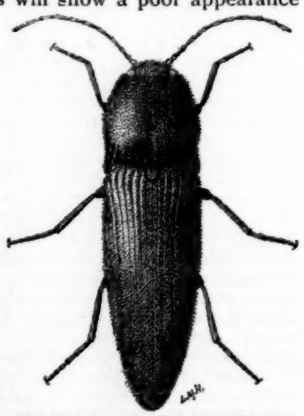

Fig. 63. A common click-beetle, Meelanotus communis.—From Forbes' Ill. Repts.

Click-beetles (see figs. 63 and 64), or Elateridæ, are easily distinguished by their power of leaping or jerking themselves upward placed upon their back. There is a peculiar structure on the under side of the thoracic segments, by means of which the insect is enabled to throw or snap itself into the air, and from this it has received its names, click-beetle and snapping-beetle. The eggs are laid before July, as a rule, in the soil in which the future larva is to find its food-supply.

Fig. 64. Click-beetle, from side with legs removed, to show the prosternal spine.

J. B. Smith.

New or Little-known Plants.

Aster infirmus.

OF the three North American Asters belonging to the section Doellingeria characterized by a manifestly double pappus with clavellate thickening of some of the bristles of the inner series, and which was formerly included in the genus Diplopappus, the most familiar is A. umbellatus, a tall plant with dense corymbs of white-rayed flowers, conspicuous in our swamps late in summer and autumn. Less well known is A. infirmus,* though described by Gronovius in 1739 and figured by Plukenet as early as 1720. This figure apparently remains the only one published, with the exception of that in Willdenow's *Hortus Berolinensis* (as A. humilis), a work not generally accessible. For this reason it is hoped that our figure on page 465, made from a wild specimen growing in Lincoln, Massachusetts, where it was found in abundance this season, may prove of interest.

Aster infirmus is very distinctly marked by its slender zigzag stem, scattered, entire ovate or obovate leaves, ciliate on the margin, and loosely corymbose heads with few broad white rays. It ranges from Georgia and Tennessee to eastern Massachusetts where it is a rare and local plant.

The third species of the section, A. reticulatus, of the Pine-barrens of South Carolina and Florida, we shall hope to figure at some future time.

Arnold Arboretum. *C. E. F.*

Cultural Department.

Bud Variation of the Concord Grape.

VARIATION in the Concord Grape has been noticed for a number of years. In the Bushberg Catalogue mention is made of a mammoth Concord that appeared twenty-five years ago. "This," the catalogue says, "has now proven to be identical with the Eaton, or, at least, if not the same Grape and of the same origin, it is so much like the Eaton in all characteristics, habits of growth, foliage, fruit, time of ripening and quality that the two Grapes cannot be distinguished. As our neighbor could tell us nothing about the origin of his Grape, but claimed simply to have received it among a lot of Concords, we have never disseminated it nor offered it for sale."

Since my attention was called to these mammoth Concords, I find, on inquiring among vineyardists and others, that they have been noticed from time to time in many localities, but usually no explanation is given for their appearance. On a recent visit to the vineyard of Mr. Walter F. Taber, of Poughkeepsie, New York, the proprietor pointed out to me one of these abnormal vines, which is certainly the result of bud variation. Mr. Taber trains his vines on the two-arm Kniffen system, renewing them from near the ground as soon as they show the need of it. The renewing is accomplished by allowing a suitable bud to grow that is situated as near the ground as possible. When the new vine has attained sufficient size, the old one is cut out and the new one is put in its place. In this manner the vine is renewed without seriously interfering with the continuous yield of fruit. The vine in question was planted in a Concord vineyard and bore Concord fruit up till the time that it was renewed. The new bud grew more vigorously than the surrounding vines, and when it came into bearing it produced not Concord grapes, but black grapes that are much larger in both bunch and berry. The quality of the fruit is inferior to that of the Concord, the pulp being watery, rather acid and flat to the taste. The skin is tender and cracks easily.

Across the river at Middle Hope, Mr. W. D. Barns has a vine that produces fruit that is nearly identical with that of the one just mentioned. This vine was received by the owner in a lot of Concord plants, and has always produced the same kind of fruit. The bunches are very large, while the berries are characterized by their large size, tender skin, watery, acid pulp and insipid taste. Mr. Barns told me of another instance where one vine that was purchased with a lot of Concords produced fruit similar to the one in his vineyard. This occurred in the vineyard of Mrs. Rose, of Marlboro, New York. The owner propagated from the vine, and now has a small vineyard of the variety which is known under the local name of Jumbo.

* Michaux, *Fl. Bor. Am.*, vol. ii., 109.

Fig. 65.—Aster infirmus.—See page 464.

Samples of these grapes were received from Mr. Taber and Mr. Barns, and when shown to prominent vineyardists they at once pronounced them to be the Eaton. Now, it is possible, but hardly probable, that a single vine of the Eaton may have been sent out in different orders of Concords from a number of nurseries. But, since Mr. Taber's vine is a bud variety, and, no doubt, there are others that could be proven to be, it seems more likely that all of these abnormally large Concords are the

results of bud variation. From the great similarity of these grapes to the Eaton we are led to question whether or not the latter is not of the same origin.

These examples form an apt illustration of the well-known facts that in many cases varieties that are practically identical have originated almost simultaneously in widely separated localities, and that fruits that are new to the originator are constantly being introduced that closely resemble standard varieties. It would seem, then, in justice to the originator of new fruits, that one should be familiar with the origin of a variety that has been introduced as new before pronouncing it to be an old sort renamed.

Experiment Station, Geneva, N. Y. *W. Paddock.*

Carnation Notes.

THE Indian summer weather of the last few days of October and first week in November has quite transformed the plants in our benches. All are now promising with buds, and the general stock never looked better at this season. The long spell of dark, damp weather during September and October was specially favorable for the spread of fungoid diseases on Carnations, and in looking over the houses of several large growers recently I noticed rust on the foliage of several varieties. So badly, indeed, have some sorts been affected that it has been necessary to throw the plants away. Della Fox, last spring's introduction, which was thought likely to supersede the ever-popular Daybreak, is more badly diseased than any other variety, and no one appears to have clean stock of it. Introducers of new varieties ought to be honest enough to state whether any kinds they are sending out have had rust. Some growers do this, but others do not. We do not believe any Carnation can be classed as rust-proof. It may be so in one place and not in a neighboring establishment. I have seen rust on all the leading sorts, with the exception of William Scott and Mrs. Fisher, but even these have this disease thirty miles from here. At present Della Fox is the only kind we grow on which rust has appeared. We syringe our plants with Fowler's Solution of Arsenic, dissolved in water at the rate of one ounce of the solution to six gallons of water, once in four or five days. A stronger application does not injure the plants, but we find that wetting every plant thoroughly with a solution of this strength kills any rust which has appeared on the leaves. This remedy cannot be claimed as a preventive, nor can any other solution thus far tried, but we believe that a persistent use of it will greatly minimize the evils so many growers are regretting. It is well to look over plants carefully once or twice a week and pick off any affected leaves which may be seen. Careful ventilating and watering, cleanliness and proper atmospheric conditions count for much in the successful cultivation of Carnations, and there is less chance of rust and other fungoid diseases getting a foothold where such details are well attended to. Jubilee, one of Mr. Hill's new varieties, was badly rusted with us in September. At present it is perfectly clean and making capital growth. We have grown it apart from all other varieties, as the introducer stated that it took rust. We hope now to carry our plants through the dull winter months free from disease and have clean stock to propagate from for another year.

Our plants were staked, tied up loosely and cleaned of all decaying foliage during October. They require looking over occasionally to have ties readjusted. At present we keep our plants cool and airy for the benefit of some benches of Chrysanthemums in the same house. When these are all cut we try to give the Carnations a night temperature as near fifty degrees as possible, preferring to have it a few degrees lower rather than higher on cold nights. During bright sunny weather, such as we now have, the benches require an average of two good waterings in a week. The water should run through the bottom of the benches. After tying our plants we scattered a light dressing of well-pulverized rotted manure and wood ashes over the surface soil. Many roots which were running along the top of the soil are now feeding on this covering, and its benefit to the plants is apparent. No liquid stimulants have yet been given, but about the middle of November we will commence to give the soil a light scattering of some chemical fertilizer once a fortnight, and a moderately weak dose of liquid cow-manure occasionally. We have been holding a number of plants in a frame until Chrysanthemums can be taken out of the house, when we will put fresh compost in the benches and plant them there. This is a convenient method where bench room is limited. The plants start to grow at once and become well established in a surprisingly short time. We have had only light frosts in this section until now, and a bed of summer-flowering varieties outdoors are still blooming profusely on November 3d.

Abundance, one of E. G. Hill's introductions, seems to be well named. With us it is proving a persistent bloomer, both outdoors and inside. It is of a good salmon-pink color and quite a dwarf grower. It has good average-sized flowers, the calyx is very stout, and when this variety is better known it will be largely grown. Triumph, certificated at Boston in 1895, is a good bright pink color, the flowers are much larger than those of Abundance and produced on long, stout stems. This promises to be a useful sort. Nicholson, which we still grow a few of, although it has been generally discarded, gives very large flowers at this season, but is not a satisfactory winter bloomer here. William Scott easily distances all competitors in its particular shade of pink and is the only kind grown to any large extent in both private and commercial places. Bridesmaid, which we are trying a second year, gives at this season some beautiful, large, clear pink flowers. It did not prove a prolific bloomer last season, however. Possibly stronger plants propagated earlier may tend to improve it next winter. Daybreak among "shell" pinks is quite badly affected with rust this year in some places. It is still largely grown and popular. We do not think Della Fox has any chance of competing with it for precedence in this class. Eldorado is proving our best yellow so far; the flowers are large and stems and calyx all that could be desired. We are trying Buttercup once more, but it will not give more than an occasional flower before spring. Goldfinch we still think highly of; it is not equal to Eldorado in size and general excellence. but proves a reliable color which is still but poorly represented. Armazindy, in the variegated class, is an acquisition. The flowers are quite large, produced on stiff stems, color pure white, lightly penciled with scarlet. We consider this superior to Helen Keller. We have not grown Minnie Cook, but patches of it which we have recently seen bear out the favorable opinion of it formed a year ago. Hector we still prefer to any other scarlet, but we grow a few plants of Portia. A good scarlet is much needed, and we hope Jubilee may fill this need: A variety as vigorous as Portia, with larger flowers, is needed. Lizzie McGowan still easily takes the lead among several good white varieties and is doing better than ever before. So-called improvements on this most popular of all white varieties do not seem to make much headway in public favor. With us it proves a constant bloomer from the time it is placed in the benches until the following September. Some varieties may have larger individual flowers, others may give larger crops at times and better-formed blooms, but for all-round excellence we prefer Lizzie McGowan to Alaska, which is probably its strongest competitor. F. Mangold continues to be the leading crimson in this district. Meteor did unsatisfactorily last year; at present it is yielding some fine flowers of a very brilliant crimson-scarlet color. The flowers are larger than those of F. Mangold, but have a tendency to come semidouble, or even single. If well grown it is undoubtedly the finest crimson we have. It did not produce sufficient flowers last year to make us think highly of it, but a second year's trial with more vigorous plants may improve our opinion of it.

Taunton, Mass. *W. N. Craig.*

Garden Notes.

I HAVE found the season of 1896 a very unsatisfactory one for Gladioli. Seedlings flowering for the first time have done very well, appearing to have greater strength than the older sorts. Even G. Brenchleyensis seemed to find the struggle against adverse circumstances almost too much for it, while such sorts as Didon, Shakespeare and Norma gave not a single flower. The Lemoinei varieties were little better as a whole, while the Nanceianus kinds were exceedingly unsatisfactory. As for the Childsi strain, if I were to judge it by this year's results I should simply throw it away. I bought in the spring a number of named varieties of most alluring descriptions, but they proved a most disappointing lot. I hope that another year they may prove valuable, but I have never seen reason to rate the strain very highly. I tried some of them a few years ago and discarded them for their inferiority. They have Saundersi for one parent and Gandavensis for the other, and certainly cannot approach in beauty the Nanceianus kinds which are raised from Saundersi and Lemoinei. I found the bulblets of Nanceianus very slow to start when planted out; of several hundred "spawn" of C. Horace de Choiseul planted this spring only four or five grew. The Lemoinei seedlings seem to grow more and more like the Gandavensis varieties; I found several among my plants this year which puzzled me; I

could not tell which series they belonged to and solved the problem by pulling them up so that they should belong to neither. The best Lemoinei kind I have ever seen I flowered this year, having just purchased it from Monsieur Lemoine; its name is Domino Rose. It is an immense rose and white flower, larger, I think, than any Nanceianus kind I have seen.

Victor Lemoine's bluish kinds (he abstains from calling them blue) are Lemoinei hybrids, and are all very striking and very good. I prefer the two called Senateur Volland and Firmament. It is curious to observe that when the time comes the same sport will occur in widely separated places. For example, some years ago a Dahlia came up in the spring in my garden. It was one of a row of seedlings and in some way was overlooked when the rest were lifted, and was covered so deeply that the winter did not kill it. That spring I imported and flowered the fine kind, Mrs. Gladstone; it was absolutely identical with my seedling. Single Cactus Dahlias appeared among my seedlings the very year they began to be noticed in England, and this year I had a blue Gladiolus, of as decided a color as any of Lemoine's, raised from seed planted before I had even seen one of his varieties. Gladioli have done as poorly everywhere in my neighborhood as with me, but Mr. J. W. Clark, of Millis, about fifteen miles away, made as good a showing at Horticultural Hall on prize day as ever. One of his spikes was the best I ever saw or heard of, as far as length of spike is concerned; it had twenty-two flowers, all fully opened and all perfect.

My stock is all lifted at last, though some of the bulbs were in the ground at least two weeks too late. All ought to be out of it by the twentieth of October, for when the ground gets cold, especially if there should be much rain, the bulbs begin to rot, the largest going first. When we leave bulbs in the ground to try whether they will be hardy if covered, we generally find that they do not come up in the spring, the fact being that they were dead and rotten before winter began.

I will add a note which will be an addition to our very meagre knowledge as to the vitality of flower seeds. Nine years ago I gave a gentleman some Dahlia seeds. He planted a part of them and put the rest into a dated paper bag. To-day he has told me that he planted the remainder this spring, and that to the best of his belief not one failed to grow.

Canton, Mass. *W. E. Endicott.*

Indoor Work.

WORK under glass is now chiefly of a routine character, but even this is not without interest, for each successive season gives a better understanding of the peculiarities and requirements of the plants. It took several years' experience to show that Lapageria rosea does not need a stove temperature, and, in fact, will not flourish under this condition, and that Odontoglossums do not need coddling in a warm house. The private gardener should keep up a good stock of flowering plants for cutting, and also for conservatory and house decoration. While Chrysanthemums will continue to occupy a prominent place for a few weeks, other plants must be borne in mind, and among these Roses are important. Cleanliness must always be observed in the Rose-house, and the more we learn of fungoid diseases and insects the greater the necessity appears for absolute cleanliness. Staking and tying should be done in the neatest possible manner, and all decayed leaves, weeds and rubbish promptly removed. Carnations need similar attention, a support of some kind being required by nearly all the varieties. If large flowers are desired, disbudding must be practiced to some extent, and abundant light and ventilation, in accordance with the weather, are essential. The matter of temperature for Carnation-growing has been much agitated of late years, and, doubtless, some varieties give better results in a comparatively high temperature. But in a general way it may be stated that the flowers produced in a temperature of fifty degrees are usually of a much more lasting character than those grown at fifty-eight to sixty degrees, the latter extreme being the practice of some growers. Bulbs for forcing should be planted in pots, pans or flats according to the use to which they are to be put, this operation being done just as soon as possible after the bulbs are received. The best place for their storage after planting is a cold frame or pit. Lily-of-the-valley of this season's crop is not satisfactory for very early forcing, on account of the tendency to produce flowers without much foliage; but after New Year the foliage and flowers will develop together with proper treatment.

A pleasant indication of advance toward a greater variety of winter-flowering plants is noted in the offering of several varieties and species of Ericas among the stock of the florists' shops, as mentioned in a recent issue of GARDEN AND FOREST, and these same species should find a more extended use among private growers. Among the best of the Heaths for this purpose are Erica hyemalis, E. Wilmoreana, E. persoluta in its various forms and E. hybrida, all of which are reasonably easy to manage and very free-flowering. Cuttings of the Heaths rooted during the latter part of winter or early in spring, potted on as they need it, and later in the season plunged outdoors in coal ashes, will usually make a substantial, well-ripened growth and flower freely the following winter or spring. The Boronias and Chorozemas are also valuable flowering plants for the greenhouse, and easily grown under much the same conditions as Ericas. A few pot-grown evergreens—for example, Retinospora plumosa aurea, Cryptomeria Japonica and R. leptoclada—are often useful for the decoration of a dark hall or other unfavorable location for plants. A few cuttings may now be put in for this purpose. If a sufficiently cool place cannot be had in the greenhouse, the cuttings should be put in a cold frame, moderately shaded and protected from severe frost, and they will be nicely rooted by spring if properly cared for.

Holmesburg, Pa. *W. H. Taplin.*

Autumn Snowdrops.

IN spite of the mild days lately prevailing, the earth has become so cold as to check floral growth, and, except a few odd belated blooms, there are no other seasonable flowers in the borders than the Snowdrops. While we are accustomed to associate the Snowdrops with the opening of the floral season, the Grecian forms of Galanthus nivalis, Olgæ and Octobrensis as naturally mark the close of the year. Of these forms the first-named is the earlier, and usually appears in September, to be followed by the latter, as its name indicates. Under the prevailing low temperature their blooming period is prolonged, and they still ornament the border. They both have the light-colored stripe down the midrib of the leaves, which is a characteristic of all autumnal Snowdrops yet found. This stripe is formed by the exposure of the interior spongy cells of that portion of the leaf, and, like the analogous coloring in the Cyclamen-leaf, is not a variegation as usually understood. The leaves of Algæ are broader than those of Octobrensis, and the bulbs and flowers rather superior in size, but they are both very good forms of the ordinary G. nivalis. The autumnal Snowdrops were long very rare plants, and all the examples of Octobrensis in cultivation were for a number of years the progeny of a single bulb found by an English Ambassador. If such a plant "grows wild somewhere," some enthusiast may be expected to find its haunts, no matter how obscure, and lately Max Leichtlin, and perhaps others, have made the Albanian Snowdrops comparatively plentiful. In this prosaic age there are still people who are not absorbed in financial questions and who will go to great lengths to collect a few plants and incidentally add to the happiness of mankind. Only the other day a friend sent me a few seeds of a rare plant, a fair share of the result of a private expedition of many miles into the southern Peloponessus, the treasure-trove giving him more happiness than many brokerages.

Elizabeth, N. J. *J. N. Gerard.*

Correspondence.

Apple-twig Blight.

To the Editor of GARDEN AND FOREST:

Sir,—In examining the trees in the experimental Apple orchard here with the object of removing all parts affected with twig or fire blight, Micrococcus amylovorus, it is interesting to note the wide difference in the extent to which different varieties are affected. Some will be almost, or entirely, free from it, while others will be so badly affected that in order not to leave any of the diseased parts it is necessary to remove almost the whole top of the tree, and this in spite of the fact that twice during the earlier part of the season all affected parts were carefully removed.

Among the sixty varieties in the orchard those most severely attacked are Lowell, Cooper's Early White, Isham Sweet, Smith's Cider and Yellow Transparent, while among those showing little, if any, damage are Celestia, Buckingham, Mammoth, Black Twig, White Winter Pearmain, Winesap and Ben Davis. The last-named variety is, perhaps, as nearly exempt from the disease as any other sort. Trees of this variety are scattered throughout the orchard in close proximity to badly affected sorts and in all the different soils which the orchard affords, and which are quite variable, yet nowhere is it seriously affected, and usually not at all. Whether one variety

will be exempt in all localities, or whether the same variety will be free in one place and attacked in another, remains to be seen, but, from my own observations, I judge that the former is largely the case. If it should prove so, and if the disease should continue as prevalent in future as it has been during the past season, the comparative susceptibility of different varieties will certainly have a strong influence in determining their popularity among those planting orchards in the future.

Geneva, N. Y. *F. C. Sears.*

Exhibitions.

Chrysanthemums in Philadelphia.

THE old building of the Pennsylvania Horticultural Society, destroyed by fire three years ago, is now more than replaced by a new fire-proof structure with all conveniences, and here the annual exhibition of the society was held during last week. Built in the style of the Italian Renaissance, the interior, as the outside, is characterized by restraint and dignity. While the main charm of the building is in the form and proportions, the decorations and coloring are likewise harmonious and artistic. The new Horticultural Hall is a credit to the society and to the city. The space occupied is ninety by two hundred feet, the front being of Pompeian brick, with three arched doorways, above which are windows of stained glass, where the sea-green prevails, which recurs in the interior decorations. Beyond the spacious vestibule a grand stairway of Tennessee marble divides to right and left above and leads to a spacious landing and corridors, where the arches are supported by columns and pilasters in green. The main exhibition room, to the west, is seventy by one hundred feet. The ceiling, thirty-five feet above, is one of the most satisfying features of this beautiful room; the walls are decorated in a warm pinkish tint, gold and sage-green showing in the designs and figures. The room is well lighted on two sides. Above the platform at the west end are three arched recesses with balconies.

In this hall were the Chrysanthemum plants, extending in broad lines throughout its length and across the front, besides a deep row set below the platform. The centre of the room was occupied by two large circular groups of Orchids and Crotons, and the side walls were pleasingly lined with masses of Chrysanthemums and of foliage plants. A screen of yellow flowering Chrysanthemums and Palms extended across the front of the platform, and ended effectively at each corner in standard plants eight feet high, crowned with immense blooms. The arrangement was admirably simple, the dependence for effect being entirely upon the plants and flowers on exhibition, and the beautiful building.

Among first-prize plants were those of the white Mrs. McK. Twombley, shown by G. Wilbur Brown, gardener to George B. Roberts, Esq., Bala, Pennsylvania; an excellent specimen of George W. Childs, from the same grower; Seedling No. 4, a well-grown plant of this new yellow Chrysanthemum, from John McCleary, gardener to William Weightman, Esq., Germantown, this being a new variety not disseminated before 1896; a plant of the variety Mrs. Frank Thompson, grown by Gordon Smirl, gardener to Joseph F. Sinnott, Esq., of Rosemont, Virginia; and in the class of a seedling plant, best variety, in not over fourteen-inch pot, a good pink seedling from the same grower. In the group of five plants, five varieties, in not over fourteen-inch pots, single stems, were some of the best specimens in the show, including plants of Elmer D. Smith, an open flower, with petals rich deep red above and silvery beneath; Mutual Friend was the white in this class; in pink, Mrs. Jos. F. Sinnott and a tall luxuriant plant of Roslyn, while a plant of the yellow Georgianna Pitcher, five feet high and as much across, was one of the best, carrying nearly a hundred blooms. Alexander Kerr won second prize in this class with smaller but evenly grown compact plants of Major Bonnaffon, Mrs. P. J. Walsh, Hicks Arnold—the only plant of this variety seen—Mrs. Paul, Jr., and Harry May. James McCleary won third prize with creditable plants, that of Georgianna Pitcher being specially good, and some of these plants were as large as any on exhibition. The class of three plants, three new varieties, introduced to commerce during 1895, included in the winning group the pink varieties William Simpson and Mrs. Jos. F. Sinnott, and a yellow seedling.

The plants of Chrysanthemums were distinctly better in vigor and size and in condition of the flowers than those shown last year, though the flowers lacked the extreme size and often the perfect form of those exhibited in Philadelphia previous to 1894. Not a few of the specimens reached five feet high from the edge of the pot, and bore in some instances, perhaps, as many flowers as those seen on the phenomenal plants grown by James Verner in earlier years. But the outline of the plants was not symmetrical, and the flowers lacked uniformity in size. The principal prize-takers were Gordon Smirl; John McCleary; J. E. Krayer, gardener to W. B. Garett; Alexander Kerr, gardener to Mrs. P. J. Walsh; C. W. Cox and Charles F. Evans.

The cut chrysanthemums were mainly staged in the arched corridors about the top of the grand staircase, and here the best opportunity was afforded to study varieties, many of the best sorts seen here not being represented among the plants. Among fifty blooms of fifty distinct varieties Frank Thompson was a good pink, W. Seward a good deep red, and other excellent flowers were Silver Cloud, Pluto and Maud Dean, originated eight years ago by Robert Craig, and one of the best varieties in the exhibition. A group of fifty blooms, not over four of a kind, comprised some of the best flowers in the entire show, and included perfect specimens of Eugene Dailledouze, Golden Wedding, the pink U. Bloodgood, the fine-petaled Iora, the globular white Mrs. U. Starin, and again Silver Cloud and Maud Dean. Among twenty-five blooms, twenty-five varieties, were notable flowers of the terra-cotta and gold Pluto, Louis Boehmer, and Modesto, similar to Eugene Dailledouze, but more golden. Flowers of Maud Dean, the largest seen in the exhibition, won first premiums as the best vase of twenty-five pink blooms, and a new pink seedling, Colonel Thomas Potter, of pleasing color and fair size, won second premium for Hugh Graham. The winner among white kinds in a similar class was Mayflower, and in yellow, Golden Wedding. Philadelphia, the startling novelty in 1894, was creditably shown by Hugh Graham and Samuel J. Bunting, to whom prizes were awarded. A striking vase of the deep golden yellow, Mrs. Louise D. Black, won first prize for Mr. Robert Craig, and Joseph Heacock and J. E. Krayer won silver cups with flowers of William Simpson. Mrs. Colonel Goodman, a variety which won a national certificate for commercial use, was shown by Mr. Charles A. Knapp, the flowers white, globular, of medium size. A collection of several hundred first-class flowers, not entered for competition, from John Cullen, gardener to Percival Roberts, won a special prize. Katherine Leech, Sunrise, Interocean and Charles Davis were notable in this group. Joseph Heacock, Wyncote, Pennsylvania, won a number of first prizes for cut flowers.

A large and handsome collection of Crotons, many of the specimens being new varieties and distinct improvements on well-known sorts, won first premiums for Robert Craig. The varied display of Orchids from Hugh Graham included rare and new flowers, and won first premium. Among these were the fragrant Zygopetalum Mackayii, Lycaste aromatica and Odontoglossum ornithoricum; a white variety of Dendrobium Phalænopsis, Oncidium varicosum Rogersii, the graceful Vanda cerulea, Cypripedium Dibdin and Odontoglossum coredina.

The supper-room contained only Ferns and other foliage-plants of medium size, and the monotone of green was admirably set off by the warm terra-cotta colored walls. A specially interesting display of Ferns from the establishment of Henry A. Dreer included sorts of easy cultivation for the house, many of them varieties of Pteris, plain and crested.

One of the most effective exhibitions was a tank of Water-lilies containing a great variety of those suitable for winter flowering, from William Tricker, of Henry A. Dreer. Besides the flowers of Nymphæas, there were many other choice water-plants, with Bamboos and decorative marsh-plants. Other displays on the first floor were of coniferous plants from the W. H. Moon Company, dwarfed Japanese evergreens from Henry A. Dreer, and roses, carnations, violets, pansies, fruits and vegetables.

The classes for this year's exhibition have been considerably changed, the premiums, exclusive of fruits and vegetables, amounting to $2,773.50. The exhibition throughout was pleasing and creditable, although it lacked any striking advance in new varieties or improved cultivation.

Chrysanthemums in Boston.

IN comparing the flower show held in Boston last week with previous autumn exhibitions of the Massachusetts Horticultural Society, the first impression was that the Chrysanthemum blooms have reached their limit as to size, and if any further improvement is to be made it must be in form, substance and color. It may be said also that there were fewer poor blooms than ever before, and therefore the cut flowers, taken together, were the best ever seen here. There were half a dozen competitors in the class for groups of Chrysanthemums mixed with foliage plants, and these together

made a striking effect and added much to the general good appearance of the show. As usual in Boston, there was great interest in the competition for twelve specimen plants. This year Nathaniel T. Kidder (William Martin, gardener) again took the first prize; Walter Hunnewell (T. D. Hatfield, gardener) took the second prize, and Mrs. B. P. Cheney (William Barr, gardener) took the third. Even the collection which was graded the lowest was very creditable, and consisted of a neat lot of small plants perfectly and evenly flowered. The twelve plants in this list were Zulinda (pink), Mrs. Robert Craig (white), Mrs. Bishop (pale yellow), Primula (straw color), W. H. Lincoln (yellow), Gold Dust (yellow), Sunrise (bronze), Mutual Friend (white), a pink form of Ivory, Columbine (bronze), Georgiana Bramhall (bright yellow). It ought to be said that Mrs. Cheney sent many other specimen plants which competed in other classes and which were good enough for any company. Mr. Kidder's group was of very uniform size, with admirable foliage and in the pink of condition as to bloom. His list of plants included Minerva (yellow), Louis Boehmer (pink), Golden Hair (yellow), Theo (French white), Edwin Lonsdale (deep pink), W. H. Lincoln (yellow), Iora, an admirable individual plant, although the flowers were somewhat bleached in color; Joseph H. White (cream color), Columbine (bronze), John Shrimpton (crimson), Clinton Chaffant (yellow). Walter Hunnewell's collection included a greater variety of types than either of the others. The colors were unexcelled and the plants were noticeably large; in fact, they were too large. Plants six feet through do not allow of such a perfect massing of color as smaller ones. It is a question whether a specimen plant, trained with very few stakes, is not more graceful than plants like those in the winning class which were brought by more staking into exact form; but certainly the rigid plants when massed together made a more attractive show. Mr. Hunnewell's plants were Gaza, with a striking white Anemone-shaped flower; C. H. Curtis, Chinese incurved; S. T. Murdock, reflexed Japanese pink; Joseph H. White; G. W. Childs, with large, deep-colored flowers, but a coarse plant; Clinton Chaffant, deep yellow; Columbine, incurved Japanese, deep bronze; Kitty Sanders, scarlet and old gold, a most beautiful combination of color; Cullingfordii, crimson; W. H. Lincoln, a mound of yellow without stakes and six feet in diameter; Louis Boehmer; G. Daniels, white, tinted with pink. Mrs. Cheney filled nearly one side of the hall with specimen plants and took prizes in almost all the other classes, and a more even and well-grown lot has rarely been seen. For other collections the chief prizes were taken by S. J. Trespass, James L. Little, Dr. C. G. Weld, Walter Hunnewell and N. T. Kidder.

Of the massed groups of Chrysanthemums, Palms and other foliage-plants, Mrs. A. W. Blake, of Brookline, took the first prize, Dr. C. G. Weld the second, J. W. Howard the third, E. S. Converse the fourth, and James Comley the fifth. Of course, the large vases filled with cut flowers were once more a great feature of the show, and John Simpkins (William Brydon, gardener), as usual, swept almost everything he competed for. The vase of Mrs. Jerome Jones (white) was superb, and his vase of mixed flowers, including Philadelphia, Viviand Morel, Mayflower, Golden Wedding, Mrs. Rand and one or two others, has rarely been equaled. The vase of mixed blooms offered by Mrs. Cheney contained H. W. Reiman, a magnificent yellow; Helen Bloodgood, an extra-fine pink; Maud Dean, Mrs. G. West, Shenandoah, red, and E. M. Bigelow, crimson. Mr. Brydon's exhibit for twenty-five blooms contained splendid flowers of Modesto (yellow), Mrs. Rand (yellow), Therese Rey (white), E. Molyneaux (crimson and old gold), Niveum (white), John Shrimpton (crimson), Florence Pullman, a noble specimen of Golden Wedding, E. Dailledouze, R. McInnes, H. W. Reiman, Mrs. Jerome Jones, Gladys Spaulding and Major Bonnaffon. Among the single flowers shown by Mrs. Cheney, Ruth Ellis, with white strap-shaped petals, was unique; Rinaldo, a handsome wine-color, and G. A. Magee, an incurved pink, were both worthy of mention. E. M. Wood, of Natick, had noteworthy vases of Molyneux, Mrs. Jones, Interocean and Golden Wedding.

For the best seedling not yet disseminated, J. Eaton, Jr., received the prize for six pink blooms, and the prize for the best white-flowered seedling went to the same grower. Charles Sander was first with a seedling of any other color, and Joseph H. White for Li Hung Chang, the best incurved variety of any color.

Of course, in an autumn show Chrysanthemums have the chief interest, but a bank of Adiantum Farleyense grown by Mr. Barr was worth notice for its admirable cultivation, and so was a vase of the new hybrid Tea Rose, Souvenir du Président Carnot, which was sent by Mr. Asmus, of New York, and was awarded a silver medal as a gratuity. François Supiot, of West Philadelphia, showed a set of new single Violets, every one of which marked a distinct advance over the old Russian single variety, which was exhibited for comparison. Dr. Weld deserved the honorable mention he received for plants of the variety Major of Browallia speciosa, which were admirably grown and have much larger and more beautiful flowers than those of the type.

Some complaint was made by visitors of the delay in attaching award cards to the plants. It was late on the second day of the show before it was learned with certainty who had taken the prizes in the cut flowers, and it would seem that when a charge is made for admission visitors have a right to know whose plants they are admiring.

Recent Publications.

L'Hortus Boissierianus. Par Eugène Autran & Théophile Durand. Genève et Bâle: Georg & Cie. Pp. 772, with portrait and two figures.

Edmund Boissier, the distinguished author of the *Voyage Botanique dans le midi de l'Espagne* and of the *Flora Orientalis*, was an ardent and successful cultivator of plants, having established at his country place of Valleyres, at the foot of the Jural Mountains, a garden which became famous all over Europe. Boissier's numerous journeys in the Orient, Italy and Spain, and his excursions into the Swiss Alps, gave him opportunities to gather roots and seeds of many alpine plants for which the garden at Valleyres was specially noted. From his knowledge of the conditions under which these plants flourish naturally he was able to devise successful methods for their cultivation, and in this Swiss garden were seen in perfect condition many plants which had defied the care of less successful cultivators.

Valleyres was Boissier's summer home. In the winter he lived on the shores of Lake Leman, where he had established a great arboretum, into which he had introduced many exotic trees, principally conifers. This arboretum, which is now the property of Monsieur Barbey, the son-in-law of Boissier, has become one of the most beautiful and important pinetums in Europe. Boissier died in 1885, and his son-in-law has now had prepared, under the title given above, a catalogue of the plants cultivated by the Swiss botanist in his two gardens at the time of his death, that the world may be able to appreciate the extent and character of the work to which he had devoted so much study and labor. The catalogue, which gives a list of the species, with the date of their publication, references to the best figures representing them, their synonyms and geographical distribution, has been prepared by Eugène Autran, the keeper of the Boissier herbarium at Chambésy, near Geneva, and Théophile Durand, curator of the Botanic Garden at Brussels, the preface being supplied by Professor Crépin, director of the Brussels Botanic Garden.

Some idea of the richness of these collections appears in the fact that the number of species and varieties cultivated in the two gardens was more than 5,000. Genera and species of alpine and subalpine plants are wonderfully represented; for example, there are 27 species of Ranunculus, 20 of Arabis, 13 of Draba, 26 of Dianthus, 107 of Saxifrage, 42 of Campanula, 25 of Gentian and 76 of Iris. Lilium is represented by 30 species, Frittilaria by 35, Calochortus by 15, etc. No one unfamiliar with the preparation of a catalogue of this sort can form probably any idea of the amount of labor necessary to determine correctly 5,000 species of cultivated plants, to establish their synonyms, geographical distribution, and to indicate the best figures which have been published of them. The work is well done, and, as Monsieur Crépin points out in his preface, *L'Hortus Boissierianus*, by the exactness of its determinations, is a book which can be most advantageously consulted by botanists and collectors, and which should occupy an important place with the best general works on garden botany. In congratulating Monsieur Barbey on the publication of this work, Monsieur Crépin takes occasion to remind his readers that the son-in-law of Boissier has

enriched science with an establishment of the first class, the Museum Boissier-Barbey, in which are admirably housed the vast herbarium and the library collected by Boissier. The herbarium is growing steadily by purchase and by collections made in different parts of the world by travelers sent out by Monsieur Barbey for the purpose, while to the library are added all the new works of descriptive botany.

Notes.

The autumn hereabout has been unusually mild and open. Nasturtiums were blooming until they were chilled by the fall of temperature last Friday night, and plants of Daphne Cneorum are still opening their fragrant flowers as cheerfully as if it were May.

No one who has a Currant-bush needs to buy plants of a nurseryman if he wishes to increase his stock. All that is necessary is to take cuttings of the new wood before the ground freezes and set them rather deeply and about three inches apart firmly in the ground where they can remain for a year. Grapes and Gooseberries can be propagated in the same way.

An agricultural experiment station has been established at Usambara, in German East Africa, for the purpose of investigating the agricultural character of that region and discovering its adaptability to various crops. Both native and introduced tropical plants are now under test at different altitudes to decide which ones are best suited to cultivation, and when these points have been determined both the plants and seeds will be supplied in commercial quantities to settlers.

Tiny young onions are coming from New Orleans, and cost ten cents for a bunch of two dozen. Cultivated sorrel, from Long Island, sells for seven cents a quart; large, well-grown heads of cauliflower bring fifteen cents each, and Brussels sprouts fifteen cents a quart. Watercress is coming from Virginia, as are peas and string-beans. Florida is also sending the latter vegetables, with eggplants and cucumbers. There are at present no field tomatoes in market, and the hot-house product costs from forty to fifty cents a pound.

Fruits of the well-known Ground Cherry, Physalis pubescens, have recently been in considerable demand in our markets by persons who like their distinctive flavor, for preserves, twenty cents a quart being the price. Husk Tomato, Dwarf Cape Gooseberry and Strawberry Tomato are other familiar names for this plant, while paper-shell tomatoes is the local trade name for the small yellow fruits. Professor Bailey's experiments with species of Physalis, published in a bulletin several years ago, were referred to in Garden and Forest, vol. v., page 108.

Mr. William Falconer, who has successfully conducted the semi-monthly horticultural journal, *Gardening*, through a hundred issues, announces in the last number of that paper his resignation as editor. Mr. Falconer's reason for retiring is that his time is thoroughly occupied in preparing and carrying out plans for the improvement of the Pittsburg park system, of which he is superintendent. It will be a difficult matter for the proprietors of *Gardening* to find a successor with as wide a knowledge of plants and as varied an experience in all branches of horticulture as is possessed by Mr. Falconer.

At a recent meeting of the Biological Society of Washington, as reported in *Science*, Dr. Irving F. Smith described a bacterial disease of Potatoes, Tomatoes and Eggplants which is caused by a new micro-organism which he names bacillus solanacianum. Dr. Smith thinks this is the cause of a large part of what is called the potato-rot in the United States. The organism is probably transmitted from diseased to healthy plants by means of insects, and in the greenhouse under strictly controlled conditions successful infections have been obtained by means of the Colorado potato-beetle. A bulletin which gives an account of this parasite will soon be published by the Department of Agriculture, and its appearance will be looked for with interest.

Pomegranates, from Spain, as bright-colored as Baldwin apples, are seen in many of the best fruit-stores, and cost from fifty to seventy-five cents a dozen. The last Japanese persimmons of the season sell for forty to sixty cents a dozen. Jamaica grape-fruit of good quality may be had at eight to fifteen cents each, and selected oranges, from the same island, cost forty-five to sixty cents a dozen. Several hundred boxes of oranges, from Punta Gorda, Florida, brought $4.50 a box, wholesale, last week, when $3.00 a box was an extreme price for Jamaica oranges. Concord, Catawba and Delaware grapes are still quite plentiful, and range from fifteen to twenty-five cents for a four-pound basket. Showy Lady-apples, small and of even size, bring twenty cents a quart; quinces, sixty-five cents a half-bushel; Crab-apples, seventy-five cents for the same quantity; and Seckel pears, from Boston, sell for twenty-five cents a quart.

In an article on the "Physiological Rôle of Water in Plants," by Professor Edmond Gain, of the University of Nancy, France, and published in the *Experiment Station Record*, among other practical applications of the subject, we are told that when a given soil produces vigorous plants whose transpiration is very active, and young plants whose organs are less developed, the roots of the first will take up the humidity of the soil with greater force than those of the second. If, therefore, the soil does not contain enough water for both, the weaker will suffer. This is the case with Clover seeded with Wheat which suffers in a dry spring, while Clover seeded alone makes a good growth. Farmers continue to sow their forage seed with cereals under the mistaken idea that the cereals are beneficial as a shade. If they would seed their forage plants alone they would not only secure a greater yield, but in dry countries would stand a better chance of producing a crop.

A good illustration of the fact that a variety of fruit may be valuable in one place and comparatively worthless in another is found in certain expert opinions gathered by *The Rural New Yorker* in relation to the Crosby Peach. So good an authority as Mr. J. H. Hale says that in Connecticut the Crosby has special value in the hardiness of its fruit-buds and its late blooming, which enables it to escape spring frosts better than others; that it is inclined to overbear, but that when thoroughly thinned the fruit is of medium to large size, and in 1895 the largest peach grown in Connecticut was one of this variety. Its flavor is better than that of any yellow peach he knows, and is the best keeper which he has shipped from Georgia. On the other hand, Mr. Charles Wright says that it is not as hardy in Delaware as many other varieties; that it is too small, even when thinned, to be of any value; that it ripens with Reeve's Favorite and Oldmixon, both of which bring better prices, and that therefore there is no place for it in the Peach orchards of the Peninsula.

The Michigan Agricultural College has issued a circular offering to young men and women who cannot spare the time and money for a long college course, special instruction in certain branches of agriculture for six weeks. One of these courses, devoted to fruit culture, embraces instruction in the propagation of plants by various methods, the care and management of orchards and kindred subjects; and another is devoted to floriculture and the forcing of winter vegetables. This last includes tuition in the construction and heating of greenhouses, the propagation of all the leading commercial plants, with lectures on botany, entomology and chemistry. Students will have the advantage of competent and enthusiastic teachers, the great college library, the forcing-houses and laboratories of the college, and the fee will only be $2.50 to cover incidental expenses. Inasmuch as board can be had near the college for $3.00 a week, an opportunity is offered for instruction at a nominal cost, and with such an environment as ought to give any young person an inspiration in his work and yield returns a hundredfold in every way.

The crown forests of Sweden comprise more than one-quarter of the entire wooded area of the country and are managed with scrupulous care. The increase alone is cut, so that a productive forest is to stand forever on all crown lands that are unsuitable for cultivation. More than this, the Government has entered upon an extensive system of planting trees on desolate and uncultivated areas, and these object-lessons have induced owners of private forests, especially the larger proprietors, to manage their timber lands so that they will become permanent sources of income. These facts were communicated to our Department of State by Hon. H. W. Thomas, United States Minister to Sweden, and they are of particular interest, not only to Sweden but also to the United States and to Canada, whose lumber meets the Swedish product as its greatest competitor in the markets of the world. Since the forests in Sweden grow slowly it has generally been supposed that the immense quantities exported would gradually exhaust this most important source of the nation's wealth, but from the facts stated it appears probable that the forty-seven million acres of forests in the country will continue to be a source of income for all future time. The products of the forest now comprise nearly one-half of the total exports of the country in value.